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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,687	08/25/2003	Robert Sigurd Nelson		3778

7590

11/06/2006

ROBERT SIGURD NELSON  
2922 Upshur Street  
San Diego, CA 92106

EXAMINER
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SUNG, CHRISTINE

ART UNIT	PAPER NUMBER
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2884

DATE MAILED: 11/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/648,687

Applicant(s)

NELSON ET AL.

Examiner

Christine Sung

Art Unit

2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 June 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3,5-10,12,13,15,16,18-21 and 24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-10,12,13,15,16,18-21 and 24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Response to Amendment***

1. The amendment filed on June 8, 2006 has been accepted and entered.
2. The Request for Continued Examination has been accepted and entered.

***Claim Objections***

3. Claim 15 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form. The claim limitation only requires the camera operate as an enhanced edge on gamma camera, a limitation stated in the independent claim.
4. Claim 21 recites the limitation "the spatial and energy resolution" in lines 3-4 of the claim. There is insufficient antecedent basis for this limitation in the claim.
5. Claim 21 recites the limitation "the relative signal strength" in lines 6-7 of the claim. There is insufficient antecedent basis for this limitation in the claim.
6. Claim 21 recites the limitation "the aperture height" in line 7-8. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claim 13 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a coarse collimator that covers each edge on detector (see figure 1), does not reasonably provide enablement for a coarse collimator that only covers alternate edge

Art Unit: 2884

on detectors. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to employ a collimator that covers alternating edge on detectors the invention commensurate in scope with these claims.

The specification does not disclose a coarse collimator that covers alternating edge on detectors, it does however disclose a coarse collimator that covers every edge on detector.

### *Double Patenting*

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claim 1 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,583,420 B1 in view of Gerstenmayer (WO 00/63723).

Regarding claim 1, the '420 Patent discloses all of the limitations of the claim (see claim 1 of the '420 Patent) except that the edge on detector measures electronically determined

Art Unit: 2884

interaction height. However, detectors that measure electronically determined interaction height are known, as disclosed by Gerstenmayer (figure 2, the interaction height is detected).

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1, 3, 5, 7, 10, 15-16 and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Gerstenmayer (WO 00/63723).

The corresponding US Patent is being used as an English translation of the French PCT.

All references used in this action will refer to the US Patent.

**Regarding claim 1**, Gerstenmayer discloses an enhanced Compton gamma camera used in nuclear medicine, comprising:

A plurality of radiation detector modules (Figure 1, elements 6), wherein each module includes:

At least one edge-on radiation detector (elements 6 are edge on detectors) that measures electronically determined interaction height (figure 2, the interaction height is detected),

A communication link for transferring data between the module and the computer system (element 30).

**Regarding claim 3**, Gerstenmayer discloses that the detector modules include edge on radiation detectors with different properties or different materials (Claim 6)

**Regarding claim 5,** Gerstenmayer discloses that the edge on radiation detector is a dual sided parallel strip semiconductor detector (see figure 1).

**Regarding claim 7,** Gerstenmayer discloses that the edge on radiation detector is a dual sided 2-d pixilated array semiconductor detector (Figure 1, 2-D on the edge side)

**Regarding claim 10,** Gerstenmayer does not explicitly discloses that the edge on detectors and detector modules can be adjusted by mechanical means including at least one of elevating, tilting and rotating. However, it is inherent that the detectors are moveable so that they can be properly positioned for detection.

**Regarding claim 15,** Gerstenmayer discloses that the camera operates as an edge on Gamma camera (column 1, lines 10-11).

**Regarding claim 16,** Gerstenmayer discloses that the camera operates as and enhanced edge on PET camera (column 1, lines 17).

**Regarding claim 18,** Gerstenmayer discloses that the camera is used for radiographic imaging (column 1, lines 19).

**Regarding claim 19,** Gerstenmayer discloses that the camera is used for radiographic CT imaging (column 1, lines 19).

**Regarding claim 20,** Gerstenmayer discloses that the camera is irradiated from the side such that the incident radiation is parallel to the plane of the edge on detector array (see figure 1, incident radiation 16 is parallel to the plane of the edge on detector array).

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2884

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gerstenmayer (WO 00/63723) in view of Kobayashi (US Patent 4,201,805).

**Regarding claim 2,** Gerstenmayer disclosed the limitation set forth in claim 1, but did not explicitly specify that the detector modules also included face on detectors. However, the combination of face on and edge on detectors is disclosed by Kobayashi (see figure 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the combination of edge on and face on detectors as disclosed by Kobayashi with the invention as disclosed by Gerstenmayer in order to increase field of view of the detector.

**Regarding claim 6,** Kobayashi discloses that the edge on radiation detector is a dual sided crossed strip semiconductor detector (Figure 1)

15. Claims 8-9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gerstenmayer (WO 00/63723) in view of Nygren (US Patent 5,434,417).

**Regarding claim 8,** Gerstenmayer discloses the limitations set forth in claim 1 but does not explicitly disclose that the detectors are stacked so as to extend the attenuation length presented to the incident radiation. However, Nygren discloses a plurality of detector modules wherein the detectors are stacked to extend the attenuation length (column 3, line 67- column 4, line 15). It would be obvious to one having ordinary skill in the art at the time the invention was made to modify the invention as disclosed by Gerstenmayer with the stacked detector module as disclosed by Nygren in order to increase the collection efficiency of the detector.

**Regarding claim 9**, Gerstenmayer discloses that the stacked detectors are comprise detector layers that use at least two different materials (claim 6).

**Regarding claim 12**, Gerstenmayer discloses the limitations set forth in claim 1 but does not explicitly specify that the gamma camera comprises

A coarse Compton collimator mounted in front of the enhanced Compton gamma camera such that it restricts the acceptance angle of incident radiation. However, Nygren discloses using a collimator (figure 5, element 66) to restrict radiation from a particular acceptance angle from incident radiation. Further, Nygren discloses that the collimator can be configured to be adapted to a number of configuration (See column 8, lines 28-51). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the collimator as disclosed by Nygren with the invention as disclosed by Gerstenmayer in order to reduce erroneous data (i.e. scattered radiation) from reaching the detector element, thus increasing the accuracy of the detected signals.

16. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gerstenmayer (WO 00/63723) in view of Nygren (US Patent 5,434,417).

**Regarding claim 13**, Nygren discloses a coarse Compton collimator (figure 5, element 66) wherein a radiation shield covers alternate edge on detectors in order to limit their direct exposure from the radiation source. Nygren discloses that the collimator can be configured to be adapted to a number of configuration (See column 8, lines 28-51). One of ordinary skill in the art would be motivated to use a collimator that covered every alternate edge on detector so as to increase the detection efficiency by increasing the amount of radiation the detector is exposed to.



Art Unit: 2884

17. Claims 21 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gerstenmayer (WO 00/63723) in view of McCroskey (US Patent 5,751,000 A).

**Regarding claim 21**, Gerstenmayer discloses a method for increasing the spatial and energy resolution of an edge on radiation detector use in nuclear medicine comprising:

Irradiating (Figure 1, element 16) the edge on detector (element 8) and measuring the relative signal strength or intensity (column 4, line 66) versus interaction location in the direction of the aperture height or position (column 4, line 67). Gerstenmayer does not specify developing a calibration data table and applying the table to permit more accurate estimates of the interaction location and energy of the detected event. However, calibration data tables and applications of those tables during image acquisition is known and disclosed by McCroskey (column 9, lines 55-65)

**Regarding claim 24**, Gerstenmayer discloses that the edge on radiation detector is at least one of a dual readout scintillator (see figure 1).

### ***Response to Arguments***

18. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Sung whose telephone number is 571-272-2448. The examiner can normally be reached on Monday- Friday 9-5 pm.


Art Unit: 2884

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CS

Christine Sung  
Examiner  
Art Unit 2884

  
**OTILIA GABOR**  
**PRIMARY EXAMINER**